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THE UNIVERSITY OF ALBERTA

GOALS, COMPETENCIES AND CONTENT AREAS FOR THE EDUCATION OF INDUSTRIAL ARTS TEACHERS IN ALBERTA

by

Ⓒ Philip Gregory Haywood

A THESIS
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
OF MASTER OF EDUCATION

DEPARTMENT OF INDUSTRIAL AND VOCATIONAL EDUCATION

EDMONTON, ALBERTA
FALL, 1975

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate studies and Research, for acceptance, a thesis entitled Goals, Competencies and Content Areas for the Education of Industrial Arts Teachers in Alberta, submitted by Philip Gregory Haywood in partial fulfilment of the requirements for the degree of Master of Education.

....
Supervisor

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Date July 4, 1975.

ABSTRACT

The purpose of this study was to:

1. Seek the opinions and gauge the reactions of Alberta industrial arts teachers to three sets of statements relating to the goals, competencies, and content areas for industrial arts teacher education.
2. Examine the effects of differences in experience, and other such variables, on the perception of industrial arts teachers with respect to the relative importance of the goals, competencies and content areas relating to industrial arts teacher education.

A survey instrument was distributed to a stratified random sample of 90 (20 per cent) of the industrial arts teachers in Alberta.

The findings of this study suggest that:

1. Alberta industrial arts teachers share a common opinion in regard to their perceptions of the important goals, teacher competencies, and content areas for industrial arts teacher education. This homogeneity of opinion was found to be consistent irrespective of experience and other variables.
2. Alberta industrial arts teachers perceive:
    a. The important goals of industrial arts teacher

education are those which are directly related to the work function of a teacher.

b. Technical competency in the use of machines and equipment together with skill and knowledge of the industrial technologies are perceived to be the most important competencies required of a industrial arts teacher.

c. Traditional industrial arts content areas are regarded as being the most important content areas for industrial arts teacher education.

It is recommended that:

1. Further research be undertaken to ascertain Alberta industrial arts teacher opinion of the subject matter content and specific teacher competencies which should be included, or developed, in the industrial arts teacher education program.

2. The Department of Industrial and Vocational Education, at the University of Alberta, should consider the introduction of regular course evaluation programs to ascertain the degree to which their courses meet the requirements of teachers in the field.

ACKNOWLEDGEMENTS

The author wishes to express his sincere appreciation to the large number of industrial arts teachers in the Province of Alberta who, by their interest, cooperation and effort in completing the survey requirements, made this study possible.

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To my wife Patricia, who through her understanding and encouragement made the compeletion of this study possible, I dedicate this thesis.

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CHAPTER I

ORIENTATION TO THE PROBLEM

In the Province of Alberta, teacher education for industrial arts has developed from a short post normal school summer session to the undergraduate and graduate programs leading toward either a Bachelor or a Master of Education degree granted by the University of Alberta.

As one of the recognised innovative programs of industrial arts in North America, the Alberta industrial arts program attempts to develop student understanding of the tools, materials and processes of industry, and of the concepts of industrial society.

As an area of general education, the Alberta industrial arts program has developed from the Practical Arts of the Northwest Territories to its present multiple activity organizational format. Industrial arts as a secondary school subject area has progressed and broadened its scope with the ever increasing advances in technological developments and innovations, production techniques, material use, and with the changing needs of society.

> This increasing rate of change is evident and attributed by many anthropologists, sociologists and students of industry to be the one constant factor prevalent in our industrial society.
> (Ziel, 1963, p. 17)

After 12-13 years of industrial arts teacher education at the University of Alberta in Edmonton, it is evident that the first major change in this Bachelor of Education degree program for industrial arts is in progress.

With the ruling, brought down by the Minister of Education, which gave notice that the minimum acceptable qualification for entry into the teaching profession in Alberta from the year 1977 was to be a Bachelor of Education degree, or the equivalent, changes in the industrial arts teacher education program were introduced.

At the University of Alberta, teacher education courses have been restructured into semester units. A number of the basic industrial arts courses are being reorganized and developed in the specific industrial arts content areas. Courses which have been arranged around the concept of a multiple activity approach to the teaching of industrial arts, together with those courses which are designed to provide the student teacher with an opportunity for specialization in some industrial arts content areas, are being introduced into the senior years of the undergraduate program.

The expressed concerns of the graduating students of 1975 in regard to the perceived deficiencies of their program of teacher education as reported by Collett (1975), and the studies by Lewchuck (1969), LeBlanc (1972) and Ible (1974) are indicative of the need for this revision in the industrial arts teacher education program.

The Problem

No evidence has been found to suggest that industrial arts teachers in the Province of Alberta have been consulted in an effort to seek the opinions of in-service teachers in regard to the required goals, objectives, and industrial arts curriculum content for a program of study designed for the specific purpose of industrial arts teacher education in Alberta.

The Purpose of the Study

The purpose of this study was to:

1. Seek the opinions of in-service industrial arts teachers from the Province of Alberta in regard to:
    a. The important goals of industrial arts teacher education for Alberta.
    b. The competencies required of an industrial arts

teacher on completion of the teacher education program.

c. The relative importance of the specific industrial arts content areas at the teacher education level.

2. Gauge the reaction of in-service industrial arts teachers in the Province of Alberta to:

a. A series of statements relating to the goals of industrial arts teacher education.

b. A list of competencies required of a beginning industrial arts teacher.

c. A list of specific industrial arts content areas which are considered typical areas in a number of industrial arts teacher education programs in Canada, United States of America, and Australia.

3. Compare the reactions of in-service industrial arts teachers to the given goals, competencies and content areas on the basis of the initial industrial arts teacher education institution, teaching experience, and present place of employment.

Significance of the Study

It is anticipated that the data obtained by this study will be of some assistance in the planning, development, and future reorganization of the industrial arts teacher education programs of study at the University of Alberta.

Scope of the Study

In this study an attempt was made to determine the opinions and reactions of industrial arts teachers in Alberta, to a list of statements relating to the goals of industrial arts teacher education, the competencies required of a teacher of industrial arts, and the major industrial arts content areas which are included in industrial arts teacher education programs in Canada, Australia, and the United States of America.

Limitations

To the knowledge of the writer no authoritative list of the goals of industrial arts teacher education for the Province of Alberta has been established, nor is there a published list of the competencies required of industrial arts teachers in Alberta.

The lists of the 13 goals and the 13 competencies used in this study were educed from the research studies of Coutts & Clarke (1972), Rieger & Woods (1971), Rieger 1974), Wiener (1971), and the writer's 23 years experience as a teacher, department head, and administrator in elementary schools, secondary schools and teacher education institutions in New South Wales, Australia.

In regard to the specific industrial arts content areas used in this study, the restrictions of the scaling technique required grouping or clustering of the individual industrial arts areas into broad fields or major areas. The effects of this clustering or grouping on individual response patterns were not included in this study.

Assumptions

1. That the items selected for the questionaire adequately cover the range of:
    a. Goals and objectives of industrial arts teacher education.
    b. Competencies required of a beginning industrial arts teacher.
    c. Major industrial arts content areas.

2. That in-service industrial arts teachers in the Province of Alberta have a similar understanding and interpretation of the terms, materials, and content areas which are related to their teaching specialty.

3. That the responses to the questionaires are a valid

indication of the respondent's opinion.

4. That the reactions of the respondents to the series of items in the questionnaire are representative of in-service industrial arts teachers in the Province of Alberta.

Definition of Terms

For the purpose of this study, the following definitions will apply:

Industrial Arts

> Industrial arts as a curriculum area is defined as those phases of general education which deal with technology - its evolution, utilization, and significance - with industry - its organization, materials, occupations, processes and products - and with the problems and benefits resulting from technological and industrial nature of society. (Maley, 1972, p. 209).

Industrial Arts Teacher

Any person qualified for certification as a teacher of industrial arts under the regulations which have been established by the Alberta Department of Education, and who, at the time of this study, was employed as an industrial arts teacher by a school board within the Province of Alberta.

Industrial Arts Teacher Education

The program of activities and experiences developed by an institution responsible for the preparation and growth of persons preparing themselves for entry into the teaching profession, as teachers of industrial arts.
(adapted from Good, 1973)

Goals of Industrial Arts Teacher Education

Statements of the general, long-range aims and objectives of education which specifically relate to industrial arts teacher education.

Industrial Arts Competencies

The specific concepts, skills and attitudes which relate directly to the role of a teacher of industrial arts.

Industrial Arts Content Area

An area of study, offered by a university or teachers' college, which is designed to provide the student teacher with the appropriate industrial arts subject matter background to qualify him or her as a teacher of industrial arts.

Urban Region

A concentration of population into a large community whose activities are primarily centred in government, trade, manufacture or allied interests. (Gould & Kolb, 1964).

For the purposes of this study the Edmonton and Calgary regions will be considered to be the two urban regions of Alberta.

Industrial Ecology

The study of the related problems and promises of industry and the new technologies in regard to the conservation and use of natural resources.

CHAPTER II

LITERATURE REVIEW

In undertaking this review of the related literature and research in teacher education, five areas were examined:

1. Historical development of industrial arts and industrial arts teacher education in the Northwest Territories and Alberta.
2. The current program of industrial arts teacher education at the University of Alberta.
3. Related research in teacher education.
4. New curriculum developments for industrial arts.
5. Thurstone's scaling technique.

Historical Developments

The first known attempt to introduce any form of industrial/vocational education into the western provinces, occurred in the mid 1830's, when the Council of the Northern Department, as the governing body for the whole of the area from Hudson Bay to the Rocky Mountains, granted financial aid to the Roman Catholic School System for the employment of two practical arts teachers. (Chambers, 1967).

No formal professional training was required of the teachers in this period; any person of good character and of moderate education was deemed to be qualified to teach.

Public demand for an improvement in both the quality and quantity of education in the Territories led to the establishment 1883 of the Board of Education to control the curriculum taught in the schools, the selection of school texts, the training and qualification of teachers, the appointment of school inspectors, and the establishment of school districts.

Teachers were classified into one of three grades. Upgrading to the next higher grade required a satisfactory report and recommendation from the local clergyman who acted as the school inspector.

The Board of Education, while being responsible for the training and qualification of teachers, did not provide the means by which teachers could gain their professional education within the Territory, until public demand again forced some action. It was not until the year of 1889, that the Legislative Assembly, faced with a serious teacher shortage, finally gave its approval for the establishment of union schools throughout the Territory. These schools, at best a compromise, were in effect composite secondary and normal schools, and as they did neither job well, were soon phased out of existence.

With increased prosperity in the Territories and with it an awakening interest in education, teacher education was expanded with the introduction of full normal school programs which required a minimum period of four weeks in full-time attendance to qualify for the award of a third class teaching certificate. (Wilson, 1970)

After ten years of educational control, the Board was replaced by the Council of Public Instruction (1893). This four member council centralized the administration of the educational systems within the Territory and replaced the part-time, generally well-meaning but often misguided and inefficient clergy-cum-inspector with full-time educational administrators. David Goggin, principal of the Manitoba Normal School, was appointed as Superintendent of Education, Chief Inspector of Schools, Director of Normal Schools and Teacher Institutes, and Director of Examinations (Wilson, 1970).

Teacher education became the sole province of the normal school.

Interest in any form of industrial education in the public school systems throughout Canada remained at a low ebb until Professor James Robertson induced the noted educational philanthropist, Sir William Macdonald, to finance the promotion and development of manual training in the public school systems across Canada (Johnson, 1968).

The Macdonald Foundation provided some four million dollars over a three year period to improve and maintain facilities for manual training, provide tools and equipment, salaries of manual training teachers imported from England, and support teacher training in this area. Twenty-one centres, chosen on the basis of their potential as a nucleus for the regional development, were selected to pilot the scheme throughout the nation.

So impressed were they by the results of the introduction of this program into the Calgary public school system, that the School Board passed the following resolution:

> Resolved that after almost two year's attendance of our pupils at manual training classes which have fully confirmed our opinion of the very great benefit to be derived from such training we strongly recommend that the subject (provisional course) be placed in the school program of studies, and that the curriculun be so modified to allow ample time for the teaching of it. (cited in Simon, 1962, p. 23)

With independence and provincial status, the Government of Alberta, under the leadership of the Honourable A.C. Rutherford, Premier and Minister of Education, established the Alberta Normal School at Calgary in January 1906, just four months after taking office.

News reports of the day indicate that, in the opinion of the local residents, the facilities of this normal school were well up to world standards:

> "One of the most creditable buildings in the city . . . the entire building reflects honour upon the government, the architect and the workmen. The structure from basement to garret is finished in the best possible style. . . .
>
> "In the basement are to be found the gymnasiums (having baths in connection) the fittings of which are the most modern procurable. There is also a room to be devoted to manual training. (cited from Department of Education, Annual Report, 1907, p. 16)

The appointment of Mr. J.C. Miller, B.Sc. to the normal school in 1907 as instructor in manual training, writing, hygiene and physiology, and physical culture, saw the introduction of manual training into the teacher education program for the Province of Alberta.

Implementation of the new manual training program into the schools of the province was a slow process. Both the federal and provincial governments were becoming concerned about the slow rate of progress in regard to the implementation of manual and technical training programs into the schools.

Mr. J.A. Smith, Chief Inspector of Schools, in his annual report of 1907 stated:

> It is unfortunate that the conservatism of tradition, or the lack of financial ability, or both, is so long in keeping manual training work from our town and country schools (Dept. of Ed., Annual Report, 1907).

By 1913, manual training was becoming well established in both the public and secondary school systems. With the assistance of the federal Agriculture Instruction Act, prevocational schools, which later led to the development of the technical schools, were established in both Edmonton and Calgary. (Department of Education, 1913)

The introduction of a summer school for manual training teachers, in 1913, at the University of Alberta, provided both the stimulus and the opportunity for the teachers of the province to extend their training beyond that of the normal school.

Simon, in examining the impact of these summer schools on the teaching profession found:

> The Normal Schools and the Department of Education's summer schools at the University of Alberta continued to provide the training required for teachers of vocational subjects. During the the first two years of World War I, attendance at the summer schools continued to rise. Out of a total of 2,213 teachers receiving credit in the four summer sessions 1913-16, 1,127 received credit in agriculture and gardening, industrial arts and domestic science courses. (1962, p. 15).

With the opening of the Provincial Institute of

Technology and Art at Calgary, in 1916, and its transfer with the Normal School to a common site on Calgary's North Hill, the stage appeared to be set for the introduction of the province's first specialist manual training teacher education program. The fact that this program did not immediately eventuate can be attributed to the economic situation of the day. Crop failures and a general economic depression resulted in a general lack of funds for anything but the bare essentials of life.

J.A. Smith in his annual report of 1923 expressed his concern for the position of both manual training and household economics in the high schools of the province:

> It is a matter of regret that the financial conditions of the cities forced the School Boards to economize along the line of Manual Training and Household Economics. Besides rejuvenating the work of the high school, and thus increasing the holding power, the students through this training developed personality in application and in breadth of interests. (Dept. of Ed., Annual Report, 1923, p. 25)

Student enrolment in manual training classes throughout the province fell from 378 in 1923 to a low of 25 seven years later.

Dr. Carpenter, as Principal of the Provincial Institute of Technology and Art, Inspector of Schools, and Director of Technical Education, managed to establish the first manual training course for teachers at the Institute in the summer of 1932. Three years later a second program attracted some 29 teachers. Dr. Carpenter wrote of the awakening public interest in "education through activity" (1935). He made special mention of the teachers who had taken part in the Institute's summer program;

> . . . devoted teachers, who, in nearly every case, have taken special courses during the summer vacation and are intensely interested in giving programs a thorough try out, real progress has been made, which is bringing satisfaction to all concerned. (Dept. of ED., Annual Report, 1935, p. 83)

Under the direction of Dr. Carpenter, a strong proponent of the general shop concept for manual training, secondary schools were in the process of reorganization in a endeavour to bring the manual training program closer to the reality of life. Attempts were being made to include practical shop subjects in all courses. New subject areas were being introduced on an experimental basis; woodwork, metalwork, technical drawing, mechanical drawing, drawing design and woodwork, and electricity all appeared in the departmental school statistics in the years from 1935 to 1937. These experimental programs were to form the basis for the introduction of the general shop program which by 1939 had replaced all other courses in the "industrial arts area".

School shops were being equipped with small, lowcost power machines which, because of their value in the new program and their suitablity for pupil use, had been recommended to the school boards.

Carpenter reported:

> With small machines for woodworking and for metal working, made available at reasonable prices and driven with power from an electric circuit, or with a small gas engine or a foot motor, a splendid equipment may be secured for a small outlay of money. (Dept. of Ed., Annual Report, 1935, p. 83)

While the majority of manual training teachers in the province had been imported from either Eastern Canada or Great Britain, the Normal School still retained its control of teacher education. Alberta teachers who wished to teach in one of the practical areas were required to reach a satisfactory standard of achievement at the Institute's summer school before being permitted to take a class. On completion of two such summer programs, a teacher was granted permanent authority to teach in the manual training area. It is interesting to note that with this additional requirement of two summer teacher education programs beyond normal school training, manual training teachers were perhaps the best-qualified group of teachers in Alberta.

Encouraged by the increasing school enrolment, the upgrading of manual training teacher requirements, and teacher interest in the new programs of work, the Institute introduced a full term program in woodwork, metalwork, electricity, art and design, and drafting for the manual training teacher as a post-normal school course. Students were also required to participate in a program which emphasized the specific methodology of teaching manual training, together with its underlying philosophy. (Simon, 1962)

The advent of the second world war stimulated society's interest in the technologies. School enrolments in general shop rose from 2,098 in 1938 to a total of 6,530 by 1945.

The Provincial Institute's involvement in the essential war-time training programs created severe accommodation problems. With the influx of trainees, facilities were stretched to the limit. The manual training program at the Institute was postponed for the duration of the war.

With the cessation of hostilities, and a return to normality, the 1943 agreement between the Department of Education, the Alberta Teachers Association, and the Faculty of Education at the University of Alberta, was implemented. The professional education of all teachers in the Province became the responsibility of the University. Thus the Province of Alberta took the lead for educational innovation in Canada. All teachers, including industrial arts, now had the opportunity to obtain a Bachelor of Education degree.

Students enrolling in the industrial arts program at the university were required to complete the first three years of the program at the Calgary Institute of Technology and Art before undertaking their final professional year in Edmonton.

Indicating his support and enthusiasm for the new teacher education program in industrial arts as the means of improving the quality and scope of future school programs in this area, A.P. Tingley, Supervisor of Industrial Arts, in his annual report for 1945, stated:

> Industrial Arts teachers desiring to secure a degree, majoring in their own particular field, have hitherto found it necessary to attend an American Institution. This opportunity is now available in Alberta, and the impact of this development will inevitably be reflected in the type of instructional services provided by those who have participated in this program. (Dept. of Ed., Annual Report, 1945.)

By 1951, new ideas in both the scope and direction of the general shop programs in the junior high school resulted in the complete displacement of general shop in favour of industrial arts. Department of Education statistics for the period show that school enrolment in general shop in 1948 stood at 6,322 with industrial arts at 101. Two years later, general shop was down to a mere 57 with industrial arts up to 8,943. By 1955 this figure had grown to 13,018 and was expanding at the rate of 16 percent per annum.

The 1950 teacher qualification legislation introduced into Alberta three levels or grades of certification for teachers in the Province. Temporary licenses were issued to teachers of elementary or junior secondary grades on completion of just one year of training. Industrial arts teachers were an exception to this rule, as they were still required to have the equivalent of two years university credit before they were permitted to teach.

The effects of a mild economic recession in Canada gave impetus to the Technical and Vocational Training Act (1960) which provided federal funds, by way of matching grants, to promote the development of vocational education throughout the dominion. Chalmers (1969) cited the establishment of the Department of Industrial and Vocational Education within the Faculty of Education at the University of Alberta as one of the direct results of the signing of this agreement.

With the establishment of the Department of Industrial and Vocational Education at the University of Alberta, the industrial arts teacher training program at Calgary was phased out.

At the University of Alberta, the industrial arts undergraduate program, under the leadership of Dr. H. Ziel, was completely revised around the concept of the multiple activity approach as the most appropiate method of introducing students to the concepts, skills and understandings of industry and manufacturing processes.

This program of industrial arts teacher education at the University of Alberta was to remain essentially unchanged from its inception until the 1974-75 academic year.

With the announcement, made by the Minister of Education, that the minimum acceptable qualification for entry into the teaching profession in Alberta would be raised to a Bachelor of Education degree, or an equivalent teaching qualification by 1977, the industrial arts teacher education program came under review. Commencing in the fall of 1974, the industrial arts courses were revised and restructured into semester units. A number of the basic industrial arts courses are being reorganized and redeveloped into the specific industrial arts content areas. Courses which have been arranged around the concept of a multiple activity approach to the teaching of industrial arts, together with those courses which are designed to provide the student teacher with an opportunity for specialization in some industrial arts content areas, are being introduced into the senior years of the undergraduate program.

The Revised Program

The industrial arts teacher education program offered by the University of Alberta (1975-76) uses the multiple activity laboratories as the basis for the teaching of the industrial arts specialization, curriculum and instruction courses.

In order to qualify for the award of the Bachelor of Education degree in Industrial Arts, students are required to complete a program of studies which includes:

	Course Equivalents
a) Non-Education Courses	7
b) Teaching Specialization	5
c) Student Teaching	2
d) Curriculum and Instruction	1
e) Basic Education Courses	3
f) Free Options	2
	20

(Faculty of Education, Calendar, 1975-76).

The suggested route for industrial arts students to meet the requirements in the industrial arts curriculum and related courses as listed in section 73.4.3 of the 1975-76 calendar is:

First Year

Technical Drawing and Design - full course equivalent.

EDIND 200 series - one and one half full course equivalents to be taken from the following:

EDIND 211	Materials I - Metals and Materials Testing.
EDIND 213	Materials II - Woods, Plastics and Earths.
EDIND 233	Technology I - Power Technology.
EDIND 235	Technology II - Graphics Technologies.
EDIND 237	Technology III - Electronic and Computer Technology.

Second Year

Approved Science - One and one half full course equivalents to be selected from:

- Chemistry
- Mathematics
- Physics

EDIND 200 Series - one full course equivalent.

EDIND 391 Multiple Activity Laboratory I - one half year course.

*Free Option - one half year course

Third Year

Approved Science - One full course equivalent to be selected from:

- Chemistry
- Computing Science
- Mathematics
- Physics

EDIND 457 Multiple Activity Laboratory II - one half year course.

EDIND 497 Curriculum Development - one half year course

*Free Option

Fourth Year

EDIND 477 Man and Technology II - one half year course.

Business Administration - one half year course

*Free Option

*Free option may include industrial education courses.

Goals of Teacher Education

Coutts and Clarke in a two year study (1972) used a modified 'Delphi' technique to determine the goals of teacher education for Alberta. Nine groups representing the Alberta Home and School Associations, School Trustees, School Principals and Vice-principals, Superintendents and Department of Education Officials, Student Teachers, Professorial Staff at the University of Alberta (two groups), Teachers, and Officials from the Alberta Teachers' Association, participated in Part 1 of the study which invited participants to originate statements about the goals of teacher education.

Coutts and Clarke classified these statements into groups, the ten most popular being termed as "Change , Values, Methods, Human Relations, Inservice Education, Individualized Instruction, Selection, Facilitation of Learning, Community, and Learning Process". Thirty-six representative statements were educed from the 2183 original submissions and listed by Coutts and Clarke as the goals of teacher education.

In Part 2 of Coutts and Clarke's study the participants were required to rate the "feasibility, desirability and probable date of acceptance" (p. 3) of each of the listed goals. Participants were also requested to comment on the list of goals and, if thought necessary, to originate an additional goal. A Q-sort was used to establish the rank order of the identified goals of teacher education.

Top ranking goals were listed as those which related to the fostering of student thought, selection of potential teachers, perception of children as unique individuals, facilitation of learning, understanding of child growth and development, human relations, understanding the learning process, and a positive feeling towards humanity. Of the twelve desirable goals which were perceived as being acceptable in the period from 1975-85, only one, relating to an early practical experience as a means by which student teachers may assess their potential for the teaching profession, was ranked in the first ten in importance among all 36 goals.

Part 3 determined the magnitude of convergence of the participant's opinion after results of Part 2 were disclosed to one half of the number of respondents. Coutts and Clarke reported some limited convergence, but generally opinion of the participants remained stable.

It should be noted that over 25 percent of the participants in this study of the goals of teacher education were members of the Faculty of Education.

Related Research in Teacher Education

Rieger and Woods (1971), on behalf of the Alberta Teachers Association, surveyed teachers' opinion of their preparation for teaching in Alberta. They found that teachers reported student teaching as the most valuable part of their teacher preparation, and that the amount of practice teaching and classroom experience should be increased. Some graduates indicated deficiences in student-teacher relations and method courses. Bachelor of Education graduates from the University of Alberta considered their preparation to be "more theoretical" than did those from Calgary.

The reasons given for the consideration of the most valuable courses indicated that teachers listed these courses on the basis of their direct practical application to the teaching situation, the provision of background knowledge in their area of speciality, and in the understanding of people.

In a follow-up study of the 1971 survey of teacher opinion of their preparation for teaching in Alberta, Rieger (1974) surveyed Alberta trained teachers who were in either their first or fifth year of teaching.

Results of this study by Rieger indicated that Alberta teachers consider the most valuable parts of their teacher education program were those which related to in-service experience, the acquisition of subject matter, and teaching methodology. Educational foundations, educational administration, curriculum and instruction, and educational psychology were perceived as being of least value in a program for the prepation of teachers for the school systems of Alberta. Teachers regarded "instruction in identifying and dealing with pupil problems" (p. 11), student teaching and discipline, and classroom management as the major aspects of teacher education which are in need of improvement, and place the responsibility for this improvement on the teacher education institutions and the employing authorities.

Lewchuck (1969) used an historical developmental approach to the description of the concept of the modern productive society, the characteristics of which were isolated into 23 categories. On the basis of these categories Lewchuck attempted to determine how industrial arts teachers in the Province of Alberta interpreted the concept of the productive society.

The results obtained by Lewchuck failed to show any consistent pattern of teacher opinion. This inconsistency in industrial arts teacher opinion of the relative importance of the various characteristics which constitute the productive society led Lewchuck to the conclusion that industrial arts teachers in the Province of Alberta had little understanding of the concept of a productive society. In reaching this conclusion Lewchuck doubted that the objectives of the industrial arts school curriculum were being met by teachers who placed little emphasis on the "characteristics of occupations, materials, processes, socialization and industrial organization" (p. 189).

LeBlanc (1972) surveyed the 450 industrial arts and vocational education teachers who had been associated with the Department of Industrial and Vocational Education at the University of Alberta from 1962 to 1971. He found that teachers believed more emphasis should be given to child development, and to those programs which lead towards self understanding.

Results of this study by LeBlanc indicated that in-service industrial arts teachers were critical of their preparation for teaching in a multiple activity laboratory. Teachers saw the need for increasing the teaching methods and occupational information content as part of the laboratory courses.

Using the "matched pairs" technique LeBlanc (p. 14) found that industrial arts teachers saw little value in ceramics in either the school or the industrial arts teacher education program. Electricity/Electronics, was ranked considerably higher in importance for industrial arts teacher education than all other industrial arts content areas.

Analysis of the comments made by the teachers who participated in the Leblanc study indicate that in-service industrial arts teachers have a strong belief in the value of student teaching, and that more time should be devoted to this area. It was further suggested, that some in-school experience is needed in each year of the university program. Some concern was expressed at the quality of some of the professional education courses, and of the practical/technical industrial arts courses which were failing to meet the school and teacher needs.

A study by Manuel (1972) into the functions of the Industrial Arts and Vocational Education Council has some implications for industrial arts teacher education in Alberta.

Manuel used the paired comparisons technique to establish in-service industrial arts and vocational education teacher perceptions of the relative importance of the possible functions of the Council. Returns by the participating industrial arts teachers indicated that the greatest need of in-service industrial arts teachers was for in-service courses, information dissemination through publications, and coordination of instructional materials.

Ible (1974), in surveying first and third year teacher graduates of the University of Alberta industrial arts program, identified the major problem areas of the beginning teacher. He came to the conclusion that industrial arts teachers, in their early years of teaching, have problems in the categories of evaluation and assessment of students, and in the acquisition and use of instructional materials and resources.

The results of Ible's study also indicated that experienced teachers were aware of, and recognised, additional problems of which beginning teachers are unaware.

Bushrod (1974) presented a series of scenarios in which he used information gathered by a "delphi" study with participants from the Alberta Department of Education, University of Alberta staff, in-service industrial arts teachers and students enrolled in the undergraduate industrial arts teacher education program at the University of Alberta. According to Bushrod, officials from the Department of Education saw the role of industrial arts in the immediate future as:

> Industrial Arts will become the interpreter of technology and bring out the impact of technology on society. It will be structured to teach knowledge and skills that will be usefull in life situations of occupational, recreational, consumer and socio-cultural significance. The content of Industrial Arts will broaden to deal with the technical, social and cultural aspects of technology.
>
> The technical aspect of Industrial Arts will involve the students in the explorations of productive

> society manipulatively both in and out of school. These broad, pre-specialized educational experiences will be career and 'good life' orientated. Skill development will be of secondary importance (p. 78).

The scenario developed by Bushrod as representing the ideas of in-service industrial arts teachers placed the role of industrial arts in a somewhat different position to that of departmental officials:

> Industrial Arts will be concerned with the ability of the individual to adapt to technological change, and will be structured so that it teaches knowledge and skills that will be useful in life situations involving occupational, recreational, consumer and socio-cultural areas. Industrial Arts curriculum content will be derived from technology. It will interpret technology and involve man's mode of thinking, doing and acting within the technologies; it will concern itself with valuing and knowing about technology as a major force in our culture.
>
> One of the main bases for the economic and social growth of our technological culture will be individual competence, ie., knowledge skills, manipulative and attitude skills. Industrial Arts will be of fundamental curricular importance in developing these skills. (p. 81).

Weiner (1971) evaluated the effectiveness of the industrial arts teacher education program at the Peru State College, Nebraska. He surveyed 103 graduates to determine their assessment of each of the three basic areas of the degree program. These areas were established as:

a. Industrial arts education.

b. Professional education.

c. General education.

The results of this study by Weiner indicated that industrial arts teachers in Nebraska perceived a need for an increased commitment to practice teaching. Teachers considered drafting, woodworking, metalworking, welding, industrial arts design, power mechanics, photography, and shop maintenance to be of high value. Graphic arts, arts and crafts, and farm and home mechanics were considered of little value for teachers in the Nebraska school system.

Crawford (1971) reviewed six of the major innovative industrial arts programs in the United States. These programs were representative of the change in emphasis from skill development to the broad role of interpreting industry in the technological society. He noted sufficient common trends and similarities in their rationale and objectives in these programs to present a general pattern for "undergraduate content courses in industrial technology" (p. 127) . This pattern, which emphasised the necessity for the basic, broad, and innovative courses in the early years of the program as the means of laying the foundation for future advanced study, provided for integrative specialist offerings to be available in the final years of the program.

Recent Curriculum Trends in Industrial Arts

Career Education

> It is essential that the industrial arts teacher accept the responsibility of teaching concepts related to careers. . . . Not only are career-orientated aspects of industrial arts important pre-requisities for vocational success, but they are a natural part of industrial arts instruction when occupational information is meaningfully correlated with activities and learning experiences in the elementary, secondary, and post secondary school programs. (Good & Good, 1972, p. 205)

> Industrial arts education has a dynamic, eminent role in comprehensive career education. The programs, services, and activities must be of high quality, realistic in view of the world of work, meaningful and suited to the needs, interests, and abilities of the students served, and available to all students at all levels. (Steeb, 1972, p. 265)

Herbert Siegal, Director of Industrial Arts for the City of New York Board of Education, in an article for the American Industrial Arts Association (1972), placed industrial arts, together with other school subjects, with a definite role in regard to career orientation. Siegal indicated that elementary school programs can promote an awareness of the world of work by providing the pupils with "tangible first hand experiences with tools, materials, processes and occupations of industry" (p. 225). Junior high schools in New York introduce the new developing technologies and manufacturing processes, with the pupils being involved with the research, design, production, and marketing of a product. The high school program is designed "to assist students in making satisfying and meaningful career decisions" (p. 227), by the provision of a variety of courses and experiences from metallurgy and mechanical drafting for the potential engineers, to unit shop programs for the vocationally orientated students.

B.W. Brown of the Chico State College (1972), stressed the need for career guidance to be included in industrial arts teacher education programs. Brown referred to the developing concept of career education as "one of the most dynamic thrusts in education today" (p. 222) and stressed the need for this concept to be part of the continuous process of education. Career education should be part of every school program from the day pupils first enrol in school and should extend right throughout the individual's working life.

Brown gave the elementary school credit for developing a career awareness, the junior high with the development of this awareness through "exploration and experimentation", and looks to the senior high for "career preparation" with "career specialization and advancement" the function of the post-secondary institutions.

In reference to the role of industrial arts teachers in this area of career guidance he stated:

> Fundamental to the concept of career education is the concomitant principle of career guidance. One without the other would be useless. Industrial arts teachers are seen by students and parents as a part of the professional guidance team; personnel in departments of industrial arts teacher preparation will need to augment both pre-service and in-service industrial arts offerings and experiences if the expectations of the patrons of our schools are to be realized. (p. 222).

> At every level of instruction, the teacher of industrial arts functions as a career counselor "without portfolio". Students ask questions about job requirements, job opportunities, the reputation of private trade schools, future educational plans, and other items because the industrial arts teacher is identified with the study of the world of work. (p. 223)

Brown suggested that it is this identification of the industrial arts teacher with the real world of work that places the teacher of industrial arts in an ideal position to function as part of the guidance team.

Discussion with many industrial arts teachers would lend support to Brown's theory. It is the writer's contention that students tend to look to the teacher of industrial arts for informal advice and guidance on careers before, and often in preference to, seeking the assistance of the professional guidance counselor.

To improve the quality of career guidance for students in all levels of school, Brown put forward a recommendation that teachers of industrial arts need some training in this area, and that the teacher education institutions should provide both pre-service and in-service programs in career guidance to satisfy this need.

Donald Maley of the University of Maryland, in a position paper on the relationship of industrial arts to "occupational orientation", recognised the concept of occupational orientation as one of the major issues of modern education (1972).

In outlining the potential of industrial arts to play a significant role in what is described as an area of national concern, Maley referred to the strong relationship between occupational education or orientation and industrial arts. In recommending occupational education as a valid area of study for industrial arts, Maley saw the need for all school subject areas to develop the flexibility to adapt to the changing needs and priorities of the society, and for educators to focus their attention on the specific needs and potential of each individual pupil.

> We in education (not just industrial arts) should give serious consideration to the development in each individual of some fundamental understandings

> about his potential, his capacities, his emotional and psychological qualities. (p. 210)

In pointing out the validity of occupational education in the study of industrial arts, Maley referred to industrial organization and occupations as legitimate facets in the study of industry, and to the fact that no other school area has the "environmental and pedagogical-philosophical arena comparable to that of the industrial arts laboratory in which to work with people as individuals" (p. 210).

Three problem areas which tend to restrict the early introduction of occupational education into meaningful programs into the industrial arts school curriculum were listed by Maley:

1. The number and variety of possible occupations.
2. The trend for fewer people being required to produce the world's goods.
3. The trend towards occupational change as the result of the ever increasing change and developments in technological innovation, scientific knowledge, and the needs of society.

> Industrial arts can and must demonstrate its capability in the national concern for occupational orientation. The opportunity and the capability are there and all that is necessary is the resolve to do it. (Maley, 1972, p. 213)

Maley placed the role of industrial arts in three broad areas:

1. The provision of an opportunity for pupils to develop an awareness and self understanding of their individual interests and potential, and other such factors which "relate to individual success, contribution, and happiness" (p. 212).

2. The development of an awareness of the industrial and technological society as an introduction to the world of work.

3. The development of the functional skills, such as manipulative, problem solving, communication and the social interactive skills which are required by an individual to enable him to cope with the environment and contribute to society.

Environmental Education

> Schools have a responsibility to alert and inform youth about emerging environmental problems and about appropriate ways for them to act in helping to solve and preclude these problems.
> (Stapp, 1974, p. 51)

The Alberta Department of Education (1974) in a position paper on their policy for environmental education for elementary and secondary schools in the Province of Alberta, viewed environmental education as as "essential and major variable in education planning, program development, and the implementation of the schooling process." (p. 2)

In regard to the implementation of environmental education into the school curriculum, the policy of the Alberta Department of Education was stated as:

> . . . environmental education should be developed as an interdisciplinary activity, consistant with the goals of basic education, and utilizing the resources of many government, social and private agencies, groups and individuals. (p. 11)

The Department of Education also recognised a need for:

> . . . short-term upgrading of environmental education activities in the current curricular package as being a primary curricular priority, especially in the disciplinary areas of the social sciences, physical sciences and industrial education. (p. 13)

The Alberta Department of Education recognized the need for financial support to ensure the effectiveness of school environmental education activities. Six activity areas were identified as warranting special financial consideration. Of the six areas identified three would appear to be directly related to industrial arts and industrial arts teacher education. These areas were listed as:

> a. Identification of environmentally sensitive components of the current curricular package.
> b. Development of modules of an interdisciplinary nature in order to upgrade present courses.
> c. Facilitation of teacher preparation for environmental education activities through the dissemination of guidelines, information, and consultative services. (p. 13)

Stapp (1974) described the strategies used in some Michigan schools to implement environmental education into the school curriculum. The Michigan approach to environmental education involved a ten phase developmental program which included the establishment of a steering committee,the setting of goals and objectives, the establishment of a school curriculum for environmental education, and in-service teacher education.

Stapp emphasised the role of teacher education as an "integral part of environmental education" to provide teachers with the "concerns, knowledge and skills" (p. 78) required to assist their pupils in resolving environmental problems.

In an attempt to establish a relationship between industrial arts and environmental education, Cauley (1972) identified the environmental education concepts which should be taught within the traditional industrial arts programs.

By the use of a jury consisting of recognized industrial arts teacher educators, Cauley identified 53 environmental concepts which were considered, by the panel, to be are related to the industrial arts area. These 53 concepts were presented to 673 industrial arts teacher educators who were requested to rate each concept in terms of its relationship to industrial arts. Six industrial arts content areas were considered to have some related environmental concepts which were deemed to be worthy of inclusion as part of the specific content area. Of the six areas, Woods received 48.1 percent of the environmental concepts, Power 23.1 percent, Drafting 17.3 percent, with Metals, Graphic Arts and Plastics/Crafts receiving 3.8 percent each.

Cauley concluded that there is a direct relationship between industrial arts and environmental education, and that environmental education concepts should be taught within the industrial arts program.

Bame (1973) examined the relationship between technology and the natural environment in an attempt to ascertain the degree to which environmental concepts are being emphasised, the degree to which they could be emphasised in industrial arts programs, and the implications for teacher education.

By the use of a jury of industrial arts educators, Bame listed 81 concepts which were considered as being relevant to technology and the natural environment. These 81 concepts were developed by Bame into an questionnaire which was submitted to 127 industrial arts and/or industrial education Department Heads at various teacher education establishments in 45 American States.

As the result of this study Bame concluded that:

> . . . the concepts relating to technology and the natural environment should become an integral part of the industrial arts curriculum. It was indicated that the technology-environment interface concepts are properly included in the industrial arts curriculum though their inclusion will require change and extension of the philosophy and objectives of industrial arts and changes in teacher education programs. (p. 117)

Terry (1971) suggested that shop classes should be concerned with those environmental issues such as use and/or waste of energy and natural resources, particularly in regard to the manufacture and production of goods, the use of recycling techniques, and the effects of industry and the industrial process on the environment.

Winn (1971) discussed the importance of environmental education at the university level. In stressing the need for a cross-disciplinary approach to the problem of environmental education, Winn included teacher education along with the social and natural sciences, the schools of engineering and city planning as an essential ingredient for the development of a integrated appoach to environmental education as the means of achieving the "most important goals" (P. 157)

Winn stated that:

> . . . the core of environmental education lies not in the science specialties, but in those areas in which science in general becomes the springboard for arguing larger questions of public policy. (p. 157)

The Scaling Technique

The scaling technique known as The Method of Paired Comparisons was developed by Thurstone, (1927) as a set of equations known as the Law of Comparative Judgment. The application of this law enabled a set of stimuli to be placed in a rank order, on the basis of a specific criteria, with the perceived level or, scale value, of the criteria determined.

The rather complex Laws of Comparative Judgment as developed by Thurstone were simplified by Torgerson (1958, pp. 163-165.) to ease the problems of computation.

Torgerson, in describing this scaling technique stated:

> In paired comparisons, each stimulus serves in turn as the standard. Each stimulus is paired with each other stimulus. With n stimuli, there are thus n(n-1)/2 pairs. Each pair is presented to the subject, whose task is to indicate which member of the pair appears greater (heavier, brighter, louder) with respect to the attribute to be scaled. The subject must designate one of the pair as greater. No equality judgments are allowed. (Torgerson, 1958, p167.)

Ferguson, in discussing the reliablity of the method stated:

> The method is usually assumed to yield a more reliable ordering than that obtained by requiring a judge to order a whole group of objects directly. (1966, p. 315)

Kerlinger recognized the method of paired comparisons for its "long and respectable psychometric past" (1967, p. 497). He described the scaling technique as a method of measurement whose purpose was to determine both simply and economically the scale values of stimuli, and as such is the "most satisfactory of psychometric methods" (P. 497).

Summary

In this review of literature, the development of industrial arts and industrial arts teacher education was traced to provide the researcher with an understanding and appreciation of the role of industrial arts as an area of education in the Province of Alberta. The survey of the historical development of industrial arts teacher education in the Province of Alberta illustrates the changes that have occurred in this curriculum area during the development of Western Canada since the latter part of the nineteenth century. Industrial arts in its relatively short history has developed a tradition of change and innovation. Junior high school enrollments in the area have continued to increase as the subject made its unique contribution to education in the Province.

Industrial arts teacher education in the Province of Alberta has increased in stature from the post normal summer courses, which were offered in 1913, to the baccalaureate and graduate degree programs offered by the University of Alberta in Edmonton.

Studies by Coutts and Clarke (1972), Rieger and Woods (1971), and Rieger (1974) have established the goals of teacher education for the Province of Alberta, and perceived needs of teachers in regard to their teacher education. However no evidence was found to indicate that the opinion of in-service industrial arts teachers had been sought to determine their opinions of what are the important goals of teacher education for the Province of Alberta, what competencies are required of an industrial arts teacher, and what are the important industrial arts content areas which should be included in the industrial arts teacher education program.

Recent developments, particularly in the United States of America, have focussed public attention on certain educational deficiencies which have been described as areas of national concern. Leading educationalists in the industrial arts discipline have suggested that two of these areas, career education and environmental education can and should be included in the industrial arts curriculum for schools and programs of industrial arts teacher education. The Alberta Department of Education policy statement clearly places industrial arts in a position of responsibility in regard to environmental education. Courses in these areas are not, at present, required of students undertaking the industrial arts teacher education program at the University of Alberta.

CHAPTER III

RESEARCH DESIGN AND PROCEDURE

This study involved the development of a questionnaire, the implementation of a pilot study, the generation of a stratified random sample from a population, the administration of the questionnaire, the collection of opinions, and the analysis of data.

The Questionnaire

Coutts and Clarke identified 36 goals of teacher education which were considered by Alberta educators, administrators, student teachers, and interested lay personnel to be appropriate goals of teacher education in the Province of Alberta. From these goals and the findings of Reiger (1974) and Weiner (1971), a list of goals pertaining to the goals of industrial arts teacher education were adapted for use in this study.

A list of competencies required of an industrial arts teacher was developed from the work of Weiner (1971), LeBlanc (1972), Lewchuck (1969), Ible (1974), and Hache (1975).

The questionnaire relating to the specific industrial arts content areas was developed from the range of specific areas of study relating to industrial arts subject matter content which are available to students enrolled in an industrial arts teacher education program at the University of Alberta, the University of New South Wales, or a traditional industrial arts teacher education establishment in North America.

The original list of goals, competencies, and content areas was tested for relevance for industrial arts teacher education in a pilot study. As the result of this pilot study the list of items used in this study was consolidated and reduced to 13 items in each of the three sections.

The scaling technique known as the method of paired comparisons formed the basis of the research method used in this study. Each goal statement was matched with every other goal statement, each competency was matched with every other competency, and each content area was matched with every other content area.

Each item was arranged and presented in the balanced order as developed by Ross (1934) to reduce the effects of a possible systematic bias. Individual items were placed at their maximum possible separation distance. With each item appearing equally in the first and second position for the paired comparison. In each section of 13 items, participants were required to choose between the two items in each of 78 pairs.

In order to reduce the time commitment for each of the selected teachers, each participant was presented with only two of the three sections. Participants received the questionnaire which related to either the goals and competencies, the competencies and content areas, or the goals and content areas. Participants were invited to make comments and suggestions about the questionnaire items, and were requested to contribute to the study by providing the researcher with a list of goals, competencies and content areas which in their opinion had been omitted from the questionnaire.

Each recipient was requested to complete the Subject Identification Sheet (Appendix 2) which was designed to collect such professional data as would enable the reactions to the items or statements by the various groups of in-service industrial arts teachers to be compared. The information collected by this section of the questionnaire included the name of the school in which the recipient was teaching, the school enrollment, the number of years teaching experience, and the name of the teacher education institution in which the participating teacher received his or her initial industrial arts teacher education.

The Pilot Study

The preliminary form of the questionnaire for this study contained 15 statements relating to the goals of industrial arts teacher education, 15 statements relating to the competencies required of a teacher of industrial arts, and 17 industrial arts content areas. Six industrial arts teachers who had been excluded from the survey completed each of the three sections of the questionnaire and evaluated the items in terms of their relevance to industrial arts teacher education. In support of their comments and suggestions, teachers taking part in this pilot study were requested to state their reasons for making such comment.

As the result of this preliminary survey, the number of items in each section of the questionnaire were reduced by either consolidation or elimination from the final format of the questionnaire.

The Population and Sample

The population of industrial arts teachers used in this study consisted of those industrial arts teachers who were employed by the various school boards in May 1975.

In order to ensure a proportional representation of all industrial arts teachers in all areas of the Province, a stratified random sample of Alberta secondary schools was drawn from the list of schools included in the Alberta Department of Education list of industrial arts teachers for 1973-74. These schools were classified as either urban or non-urban in accordance with the definition as stated in Chapter 1 of this study.

As the two urban regions of Calgary and Edmonton accounted for just under half of the total industrial arts teacher population in Alberta, it was decided to statify the urban classification to ensure each of the two major centres of industrial arts in the Province received proportional representation in this study.

The Alberta Department of Education has, in each year, produced a list of industrial arts teachers who, at the time of the listing, were teaching industrial arts in the secondary schools of the Province. The 1973-74 list, which was current at the time of this investigation, contained the names of 455 teachers who were employed in 310 Alberta secondary schools. Of these, 134 were included in the greater Edmonton region, 80 in Calgary, and the remaining 231 were allocated to the non-urban category.

The University of Alberta computer was used to generate three sets of random numbers. On the basis of these generated numbers secondary schools were drawn from each category until 20 percent of the industrial arts teacher population for the three classifications had been identified.

Administration of the Questionnaire

Survey Permission Requests

In order to gain the required permission to contact the teachers identified in the sample, it was necessary to seek the appoval of the Superintendents of Schools for the various school districts in which the selected teachers were located. The approach to the Superintendents of Schools in the Edmonton and near-Edmonton school districts was made through the Division of Field Experiences at the University of Alberta. A letter seeking permission to contact the selected industrial arts teachers was mailed to each of the superintendents of the school districts concerned. (Appendix 2).

The researcher encountered some difficulties at this stage of the study. At the time at which it had been planned to mail these permission requests, the Canadian postal service was at a virtual standstill, with the news media forecasting a long period of industrial unrest. A long period of delay in this essential service would have resulted in some curtailment of the proposed study. Settlement of the dispute, at least in part, enabled this study to proceed, however with the delay caused by the uncertain conditions and the approach of the end of the school year, insufficient time was available for the researcher to give the Superintendents adequate notice prior to the final date of distribution of the questionnaires. As pupils were not to be involved it was decided to assume that the necessary permission would be granted. One superintendent objected to this assumption and regretfully withdrew his permission for the reseacher to involve the selected teachers from his school district. All other superintendents granted the necessary permission of entry. A letter of apology was sent to the dissenting superintendent.

In addition to the Edmonton Public School Board requirement of the research results, two superintendents showed interest in the study and requested copies of the research findings.

Distribution of the Questionnaire

Ninety in-service industrial arts teachers were selected and invited to participate in this study. To each of these selected teachers was mailed or hand-delivered a package containing the survey instrument. (Appendix 3). This instrument included:

1. A letter seeking the cooperation and assistance of the teacher concerned.
2. A set of instructions.
3. A Subject Information Sheet.
4. Two sections of the questionnaire.
5. A stamped self-addressed envelope for the return of the completed questionnaire.

Teachers in the Edmonton, Lacombe, Red Deer, Olds, and Calgary school districts received the survey instrument by hand delivery and generally had the opportunity for some discussion with the researcher. It is assumed that all other teachers who had been included in the survey received the survey instrument through the mail.

Follow-Up Procedures

Ten days after the distribution of the survey package, a follow-up letter (Appendix 4) was mailed to each of the selected teachers who had failed to reply to the original questionnaire.

A letter of appreciation was sent to those teachers who participated in the study.

Analysis of Data

Statements relating to in-service industrial arts teacher opinion of the important goals for industrial arts teacher education, the competencies required of an industrial arts teacher, and the specific industrial arts content areas for industrial arts teacher education programs, were listed under the appropriate classification heading. In such cases where an opinion was expressed by more than one respondent, a repesentative statement of that opinion was listed.

The information collected by the survey instrument was entered on to punch cards for computer analysis by the use of the University of Alberta XDER:SCAL01 program. This program has been designed to determine, by the use of Torgerson's least-squares procedures (Torgerson, 1965, p. 170-179) the scale value of each item of a set of stimuli using data obtained by the method of paired comparisons. This program takes into account those situations in which a single item is chosen by all subjects in preference to one other item, or with such cases in which all respondents do not respond to each and every pair of the matched pairs.

By the use of the descriptive statistic termed Pearson's Product Moment Correlation Coefficient, comparisons between the reactions of in-service industrial arts teachers to the set of statements relating to the goals of industrial arts teacher education, the competencies required of an industrial arts teacher, and the industrial arts content areas, were made on the basis of the following categories:

A. Geographic Location.
    1. The Province of Alberta.
    2. Northern Alberta.
    3. Southern Alberta.

B. Population Density.
    1. Urban.
    2. Non-Urban.

C. Years of Teaching Experience.
    1. One to Four Years.
    2. Five to Ten Years.
    3. More Than Ten Years.

D. School Assignment.
    1. Junior High School.
    2. Senior High School.

E. Initial Teacher Education Institution.
    1. University of Alberta, Edmonton.

2. Other Teacher Education Institution.

CHAPTER IV

PRESENTATION OF RESULTS

Questionnaire Returns

Of the ninety questionnaires which were distributed to the selected in-service industrial arts teachers, 68 (75.6 per cent) were returned. One return was rejected as the respondent had failed to make a choice between the various items on the questionnaire, stating that "All were equally important". Two other respondents did not respond to both sections of the questionnaire.

The profile of respondents, as shown in Table 1, represents the distribution of the in-service industrial arts teachers, who participated in this survey, by category or independent variable as used in this study. It was noted that teaching experience ranged from less than one full year of teaching to a maximum of 37 years. The majority of the respondents indicated that they had less than eleven years teaching experience. Over half of the respondents indicated that they had received their industrial arts teacher education at the University of Alberta in Edmonton. Eight

Table 1.

Profile of Respondents by Category

Category	Distribution	
	No.	%
A. Geographic Location.		
1. The Province of Alberta.	67	100.0
2. Northern Alberta.	40	59.7
3. Southern Alberta.	27	40.3
B. Population Density.		
1. Urban.	36	53.7
2. Non-Urban.	31	46.3
C. Years of Teaching Experience.		
1. One to Four Years.	19	28.3
2. Five to Ten Years.	23	34.4
3. More Than Ten Years.	25	37.3
D. School Assignment.*		
1. Junior High School.	33	49.3
2. Senior High School.	27	40.3
E. Initial Teacher Education Institution.		
1. University of Alberta, Edmonton.	38	56.7
2. Other Teacher Education Institution.	29	43.3

* Excluding respondents from Junior-Senior High Schools.

respondents indicated that they received their teacher education in Calgary, three were from other provinces, four from England, one each from Jamaica and the Philippines, with the remaining ten industrial arts teachers indicating that they had received their professional education in the United States of America.

Industrial Arts Teacher Opinion

Nineteen (28 per cent) of the responding in-service industrial arts teachers listed at least one additional goal, competency or content area which they considered to be of importance in the education of industrial arts teachers.

The five statements relating to the goals of industrial arts teacher education were:

> More emphasis should be placed on work attitudes and craftsmanship as opposed to preoccupation with ethics and professionalism.
>
> Creativity - Adaptability - Innovation.
>
> Philosophy of Industrial Arts should centre around Alberta industry then Canadian industry, and not American industry first and Alberta last.
>
> Encouragement of professional growth. (2 responses)

Fourteen statements were received in regard to the competencies required of an industrial arts teacher. Seven of these statements were directly related to a need for industrial arts teachers to have developed skill in the safe use of machines and equipment. The other statements were:

> A good knowledge of career guidance.
>
> The development of positive attitudes towards the safe and economical use of materials.
>
> Skill in the management of the industrial arts learning centre.

Areas listed as appropriate content areas for industrial arts teacher education were:

"Automotive maintenance."

"Basic electricity."

"Career guidance."

"Home maintenance."

"Hot metals."

"Hydraulics."

"Industrial economics."

"Machine and tool maintenance."

"Research and development."

"School finance."

Teacher Reactions to the Questionnaire

As previously stated, each of the 67 respondents received two sections of the questionnaire which included the three specific aspects of industrial arts teacher education under consideration in this study. The number of returns received in each of these three sections, for each category of industrial arts teachers, is shown in Table 2.

These returns were analysed to determine the perceived relative importance of each of the 13 goal statements, the 13 competencies, and the 13 industrial arts content areas which were included in the questionnaire. The rank order and scale value derived for each item in each of the three sections of the questionnaire for each classification, or category group, are listed in the Tables of Results (Appendix 1).

Comparative analysis of the results obtained by the scaling technique indicated that there was no significant difference in the ranking or scale values as ascertained for each of the teacher category groups in any of the three sections under investigation. The correlation coefficients, listed in Table 12 (Appendix 1), ranged from 0.807 to 0.963. On the basis of these variables, the probability that the various teacher category groups were not part of the same population was found to be 0.001 or less.

On the basis of this comparative analysis, the results as reported here are those which were derived from the data contained in the responses to the questionnaire items by the total group of respondents.

Table 2.

Number of Respondents per Section by Category

Category	Section *A.	Section *B.	Section *C.
A. Geographic Location.			
1. The Province of Alberta.	43	45	44
2. Northern Alberta.	24	27	27
3. Southern Alberta.	19	18	17
B. Population Density.			
1. Urban.	22	24	25
2. Non-Urban.	21	21	19
C. Years of Teaching Experience.			
1. One to Four Years.	10	14	12
2. Five to Ten Years.	20	13	16
3. More Than Ten Years.	13	18	16
D. School Assignment.			
1. Junior High School.	23	20	22
2. Senior High School.	17	18	19
E. Initial Teacher Education Institution.			
1. University of Alberta, Edmonton.	25	25	23
2. Other Teacher Education Institution.	18	20	21

*A. Goals of industrial arts teacher education.
*B. Industrial arts teacher competencies.
*C. Industrial arts content areas.

Goals of Industrial Arts Teacher Education

Forty-three respondents returned this section of the questionnaire which related to the goals of industrial arts teacher education.

The derived rank order of the 13 goal statements together with their computed scale values are recorded in Table 3. Figure 1, page 63, illustrates the differences in the scale values which were ascertained for each of the goal statements.

The total group of respondents representing the industrial arts teachers of Alberta, ranked the development, in the student teacher, of the ability to develop and manage appropriate learning situations for industrial arts as the most important goal for industrial arts teacher education. Goals relating towards (a) the desire to interest, guide and work with children, (b) to communicate ideas, feelings and experiences, and (c) the ability to foster in children the potential for enquiry, experiment and analysis, were also ranked high in importance for teacher education. The development of an understanding and acceptance of professional ethics, the attainment of emotional and social adjustment, and the development of a desire for further

Table 3.

Rank Order and Scale Values of the Goals for Industrial Arts Teacher Education in Alberta.

Rank Order	Scale Value	Item No.	Goal Statement
			To develop or provide the student teacher with:
1	+1.157	2	The ability to develop and manage appropriate learning situations for industrial arts.
2	+1.134	3	A sincere desire to interest, guide and work with children.
3	+1.021	9	The ability to convey ideas, feelings and/or experiences to others with clarity.
4	+1.004	8	The ability to foster in children the potential for enquiry, experiment and analysis.
5	+0.690	1	The appropriate and sufficient industrial arts subject matter background.
6	+0.437	6	An understanding of child growth and development and its relationship to learning theory.
7	+0.086	12	The characteristics of flexibility and adaptability to cope with future change.

Table 3. Continued

Rank Order	Scale Value	Item No.	Goal Statement
8	-0.096	5	A knowledge of lesson plans and programming for the multiple activity laboratory.
9	-0.356	4	A defensible and practical philosophy of industrial arts education.
10	-0.693	11	An understanding of the community and its human and material resource potential.
11	-914	10	A desire for further study and professional growth.
12	-1.445	13	The opportunity to attain emotional and social adjustment.
13	-2.027	7	An understanding and acceptance of professional ethics.

```
                  Goal Statement Number

                            |
                           2*************
                            |
                           3************
                            |
                           9***********
                            |
                           8***********
                            |
                           1********
                            |
                           6*****
                            |
                          12**
                            |
                           ** 5
                            |
                         **** 4
                            |
                      *******11
                            |
                    *********10
                            |
              ***************13
                            |
        ********************* 7
                            |

--------|---------|---------|---------|---------|---------

       -2        -1         0        +1        +2
                            Standard Deviation Units
```

Figure 1.

Profile of Scale Values of

Goals for Industrial Arts Teacher Education in Alberta.

study and professional growth were ranked as the least important of the listed goals.

Industrial Arts Teacher Competencies.

Forty-five questionnaires were returned for analysis in this section of the study which involved the ranking and computation of the scale values for the 13 statements relating to the competencies required of an industrial arts teacher in the Province of Alberta.

The derived rank order of the 13 competency statements together with the computed scale values are recorded in Table 4. Figure 2, page 71, illustrates the differences in the scale values which were ascertained for each of the competency statements.

Industrial arts teachers throughout the Province of Alberta, rated skill in the proper and safe use of machines and equipment as the most important competency required of an industrial arts teacher. The competencies relating to a knowledge of the fundamental concepts of the industrial technologies, appreciation of the role of industrial arts in the general education of children, skill in the use of hand tools, and the ability to control the budget, tools and materials in the industrial arts laboratory, being perceived as the next most important industrial arts teacher

Table 4.

Rank Order and Scale Values of the

Industrial Arts Teacher Competencies.

Rank Order	Scale Value	Item No.	Competency Statement
1	+1.803	2	Skill in the proper and safe use of machines and equipment.
2	+1.122	3	The skill and knowledge necessary to teach the fundamental concepts of industrial technology.
3	+0.815	11	An appreciation of industrial arts and its role in the general education of children.
4	+0.599	1	Skill in the proper and safe use of hand tools.
5	+0.564	4	The ability to budget, requisition and manage the control of materials, tools and equipment.
6	+0.383	7	The ability to maintain the tools and equipment used in the multiple activity laboratory.
7	+0.311	6	The ability to solve problems by the use of the materials and processes of industry.

Table 4. Continued

Rank Order	Scale Value	Item No.	Competency Statement
8	-0.116	10	A knowledge and appreciation of the materials used in industry.
9	-0.681	12	An understanding of industry and its effect on the environment and society.
10	-0.686	5	The ability to understand and interpret industry and the productive society.
11	-1.032	9	A knowledge and understanding of vocational and/or career guidance.
12	-1.270	13	An understanding and appreciation of good industrial design.
13	-1.812	8	The ability to create and interpret engineering and architectural drawings.

```
Competency Statement Number No.

                            |
                           2*******************
                            |
                           3************
                            |
                          11*********
                            |
                           1*******
                            |
                           4*******
                            |
                           7*****
                            |
                           6****
                            |
                           **10
                            |
                     ********12
                            |
                     ******** 5
                            |
                  *********** 9
                            |
               **************13
                            |
           ******************* 8
                            |

--------|---------|---------|---------|---------|---------

       -2        -1          0        +1        +2
                            Standard Deviation Units
```

Figure 2.

Profile of Scale Values of the

Industrial Arts Teacher Competencies.

competencies.

The competencies relating to the application of the principles of drafting, the understanding and appreciation of industrial design, and a knowledge of career guidance were considered by the total group of respondents to this section to be of least importance in the program of industrial arts teacher education. Perceived as being of relatively low importance were the two competencies relating to industry and the productive society, and their effects on the environment.

Industrial Arts Content Areas

Forty-four respondents returned the industrial arts content area section of the questionnaire.

The derived rank order of the 13 content areas together with the computed scale values are recorded in Table 5. Figure 3, page 74, illustrates the differences in the scale values which were ascertained for each of the content area statements.

On a provincial basis, the total group of respondents placed woodwork as the most important of the 13 listed industrial arts content areas in the industrial arts teacher education program. Graphics, power technology,

Table 5.

Rank Order and Scale Values of the Industrial Arts Content Areas

Rank Order	Scale Value	Item No.	Content Area
1	+1.691	1	Woodwork
2	+0.855	6	Graphics
3	+0.832	8	Power Technology
4	+0.796	11	Electronics
5	+0.791	2	Metalwork
6	+0.505	7	Drafting
7	+0.519	4	Plastics
8	-0.230	10	Materials Science
9	-0.945	5	Ceramics
10	-0.955	9	Production Science
11	-1.033	12	Industrial Design
12	-1.332	3	Arts and Crafts
13	-1.494	13	Industrial Ecology

```
                   Content Area Number

                            |
                           1******************
                            |
                           6**********
                            |
                           8*********
                            |
                          11*********
                            |
                           2*********
                            |
                           7******
                            |
                           4******
                            |
                           **10
                            |
                   ********** 5
                            |
                  *********** 9
                            |
                  ***********12
                            |
               ************** 3
                            |
             ****************13
                            |

--------|---------|---------|---------|---------|---------

       -2        -1         0        +1        +2
                            Standard Deviation Units
```

Figure 3.

Profile of Scale Values of the

Content Areas for Industrial Arts Teacher Education in Alberta.

electronics, metalwork, drafting, and plastics were rated as the areas which were considered to be next to woodwork in value as industrial arts content areas for an industrial arts teacher education program.

The areas of industrial ecology, and arts and crafts were perceived to be the least important of the content areas listed. Industrial design, production science, and ceramics were considered to be of low importance in the education of industrial arts teachers.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to:

1. Seek the opinions of in-service industrial arts teachers from the Province of Alberta in regard to:
    a. The important goals of industrial arts teacher education for Alberta.
    b. The competencies required of an industrial arts teacher on completion of the teacher education program.
    c. The relative importance of the specific industrial arts content areas at the teacher education level.
2. Gauge the reaction of in-service industrial arts teachers in the Province of Alberta to:
    a. A series of statements relating to the goals of industrial arts teacher education.
    b. A list of competencies required of a beginning industrial arts teacher.
    c. A list of specific industrial arts content areas which are considered typical areas in a number of industrial arts teacher education programs in Canada, United States of America, and Australia.

3. Compare the reactions of in-service industrial arts teachers to the given goals, competencies and content areas on the basis of the initial industrial arts teacher education institution, teaching experience, and present place of employment.

A survey instrument incorporating an introductory letter, a set of instructions, a subject data sheet, and two sections of a three part questionnaire (Appendix 2.) was distributed to a stratified random sample which included approximately 20 per cent of the industrial arts teachers in Alberta.

The returns of the 67 Alberta industrial arts teachers who elected to participate in this study, were analysed to determine:

a. The opinions of industrial arts teachers in regard to the goals of industrial arts teacher education, the competencies required of an industrial arts teacher, and the importance of the industrial arts content areas.

b. The reactions of industrial arts teachers to the three sets of statements relating to the listed goals of industrial arts teacher education, the competencies required of an industrial arts teacher, and the industrial arts content areas.

c. The extent to which Alberta industrial arts teachers differ in their reactions to the questionnaire statements on the basis of their geographic location in the province, their years of teaching experience, the type of school in which they teach, and their initial industrial arts teacher education program.

Respondents were classified into five categories under the headings of; Geographic location, Population density, Teaching experience, School assignment, and Initial teacher education institute. Data collected by each section of the questionnaire was subjected to computer analysis and the results obtained were further analysed to compare the reactions of respondents in each of the five categories.

Conclusions

The results obtained in this study indicate that Alberta industrial arts teachers share a common opinion in regard to the relative importance of the goals for industrial arts teacher education, the competencies required of an industrial arts teacher, and the specific industrial arts content areas which are perceived to be of importance in the education of an industrial arts teacher in Alberta.

This lack of divergence in the opinions and reactions of industrial arts teachers, as shown by the responses to to the questionnaire, was found to be true for all teacher category groupings. Such variables as years of teaching experience, whether or not they teach in a large city or a rural community, whether or not they live in the north or south of Alberta, or whether they received their teacher education at the University of Alberta in Edmonton or elsewhere does not appear to have any effect or influence on industrial arts teacher opinions in regard to the important goals of industrial arts teacher education, the competencies required of an industrial arts teacher, or the specific industrial arts content areas which are considered to be important in the education of industrial arts teachers.

By selecting, as the four most important goals of industrial arts teacher education, those goals which are related to the development of management skills for the industrial arts learning situation, the interest in guiding and working with children, the development of effective communication skills, and the ability to encourage or develop in children the potential for enquiry, experiment and analysis, Alberta industrial arts teachers have indicated that they perceive the most important goals of industrial arts teacher education to be those which have a direct relationship to the work function of the teacher in an industrial arts laboratory.

The least important of the listed goals for industrial arts teacher education, as perceived by the teachers in the field, are those which relate to the development of professional ethics, social and emotional adjustment, and professional growth.

In the opinion of in-service industrial arts teachers, it is of prime importance that graduates from a program of industrial arts teacher education should be technically competent in the safe and proper use of tools and equipment which are used in the school industrial arts laboratories. Industrial arts teachers see a need for graduating students to have the skills and knowledge which are necessary in the teaching of the fundamental concepts of industrial technology.

It is quite apparent that in-service industrial arts teachers regard skills, knowledge and understanding of the relevant industrial arts tools, equipment, materials and technologies as the essential competencies which are required of an industrial arts teacher in Alberta.

A knowledge and understanding of career guidance, industrial design, or an ability to create and interpret engineering or architectural drawings are teacher competencies which are perceived to be of lesser importance by industrial arts teachers in Alberta.

Alberta industrial arts teachers perceive woodwork to be the most important content area in an industrial arts teacher education program. Traditional industrial arts content areas of graphics, power technology, electronics and metalwork are regarded as of equal importance somewhat behind woodwork.

Industrial ecology, arts and crafts, industrial design and ceramics are regarded to be of lesser importance in the education of industrial arts teachers in the Province of Alberta.

Discussion

The findings of this study suggest that Alberta industrial arts teachers tend to be rather conservative in their outlook towards their professional education. It could be argued that industrial arts teachers view the prime function of teacher education as an area of vocational training in which the student teacher is provided with the required "job skills", or qualification for entry into the teaching profession.

The most interesting factor to emerge as the result of this study was the apparent lack of divergence in the opinions or reactions of Alberta industrial arts teachers to the three sets of statements included in the questionnaire. With such a large percentage of the teaching population being drawn from a variety of teacher training institutions other than the University of Alberta, it was expected that each institution would have left its own particular bias. This was obviously not the case in this study. One factor which could account for this homogeneity in opinion of teachers, may well be the unifying influence of the Alberta industrial arts curriculum.

If this is the case, then why is it that there is no apparent difference in opinion between junior high and senior high school teachers? Is there a sufficient difference in the two programs to warrant a difference in teacher opinion? If the program for industrial arts at the senior high school level does continue in the same basic theme of the junior high school, how does this affect senior high enrollments in this area? Why have senior high school enrollments continued to fall over the past ten years? These question have been brought to light in the course of this study, but must remain unanswered until the necessary research has been undertaken.

The apparent anomaly in the position of drafting may well be attributed to the feeling that industrial arts teachers have towards this area. Alberta industrial arts teachers apparently believe that drafting is one of the major means of industrial communication and as such has an important place in the education of teachers, however, in the Alberta schools drafting appears to be one of the fringe areas with little place in the multiple activity laboratory.

It is interesting to note that the Alberta Department of Education has made a clear policy statement in regard to the importance of environmental education in Alberta. Industrial education being one of the disciplines which was singled out in recognition of the fact that the area is suited for the introduction of environmental activities. On the other hand industrial arts teachers ranked industrial ecology as the least important of the 13 content areas.

After some discussion with a number of the respondents, the researcher gained the impression that the relations between the University and the teachers in the field could be improved. As a means of improving the communication and relations between in-service industrial arts teachers and the organization which is charged with the responsibility for their professional education, it is suggested that an advisory committee be established. This committe could be headed by the Chairman of the Department of Industrial and Vocational Education, and could consist of:

a. Representatives from the staff of the Department of Industrial and Vocational Education.

b. A representative from other departments and faculties which offer required industrial arts teacher education courses.

c. A number of representatives of the teachers and others in the area of industrial arts and industrial education.

The role of the advisory committee could well be to open a line of communication between the various professional groups who have the educational responsibility, either directly or indirectly, at all levels in the area of industrial education.

While this study was primarily concerned with industrial arts teacher education, it appears to be quite obvious that the results do have some implications in regard to the school curriculum. The relatively poor standing of ceramics, arts and crafts, and production science could well be taken as an indication that teachers would prefer to exclude these areas from the school curriculum.

Recommendations

1. The findings of this study indicate a definite need for more research in this area of teacher perception of the essential requirements in the professional education of industrial arts teachers in Alberta. Still unanswered are such important questions as:

a. What subject matter should be included in, or excluded from, each of the industrial arts content areas?
b. What specific teacher competencies are required in each of these content areas?
c. How effective is the present industrial arts teacher education program in the preparation of industrial arts teachers for the junior high schools of Alberta?

d. How effective is the present industrial arts teacher education program in the preparation of industrial arts teachers for the senior high schools of Alberta?

2. The Department of Industrial and Vocational Education at the University of Alberta should investigate the possibility of introducing a regular evaluation program

in the specific industrial arts content areas which form part of the industrial arts teacher education program to determine the extent to which the requirements of the student industrial arts teachers, as perceived by in-service industrial arts teachers, are being met by the current program. If the program is found to be deficient in some areas, some courses may require modification and reorganization to ensure that graduates of the program do reach the standards of competence in those areas which industrial arts teachers perceive to be of particular importance in their professional education.

BIBLIOGRAPHY

BIBLIOGRAPHY

Alberta, Department of Education, *Annual Report*, Edmonton: Author, 1907.

Alberta, Department of Education, *Annual Report*, Edmonton: Author, 1913.

Alberta, Department of Education, *Annual Report*, Edmonton: Author, 1923.

Alberta, Department of Education, *Annual Report*, Edmonton: Author, 1935.

Alberta, Department of Education, *Annual Report*, Edmonton: Author, 1945.

Alberta, Department of Education, *Annual Reports*, Edmonton: Author, 1948-55.

Alberta, Department of Education, *Directions for environmental education*, Edmonton: Author, 1974.

Bakamis, W.A. *Improving instruction in industrial arts*. New York: The Bruce Publishing Company, 1966.

Bame, E.A. *Concepts of the interface between technology and the environment*. Doctor of Education thesis, North Carolina State University, Raleigh, 1973. (Xerox University Microfilms No 73-29523)

Brown, B.W. Industrial arts teacher preparation and planned-for career guidance. *Man/Society/Technology*, 1972, *31*, 222-224.

Cauley, M.J. *Industrial arts and environmental education*. Doctor of Education thesis, University of Northern Colorado, 1971. (Xerox University Microfilms No 72-13307)

Bushrod, S. *The role of industrial arts in the secondary schools*. Unpublished Master of Education thesis, University of Alberta, 1974.

Crawford, B.Jr. Scope and sequence of content. In E.R. Willis & J. Streicher (Eds.) *Components of teacher education*, 20th Yearbook, American Council on Industrial Arts Teacher Education. Bloomington, Illinois: McKnight & McKnight, 1971.

Collett, D. *Concerns voiced by student representatives*. Unpublished committee report, Department of Industrial and Vocational Education, University of Alberta, 1975.

Coutts H.T., & Clarke S.C.T. *The goals of teacher education* . (Research Monograph No.20). Edmonton, Alberta: The Alberta Teachers Association, October, 1972.

Faculty of Education. *Calendar 1975-76* Edmonton, Alberta: The University of Alberta, 1975.

Ferguson, G. A. *Statistical analysis in psychology and education* (2nd ed.). New york: McGraw-Hill Book Company, 1971.

Gallagher, J.E. *A descriptive analysis of industrial arts in Alberta*. Unpublished Master of Education thesis, University of Alberta, Edmonton, 1963.

Good, C.V. (Ed) *Dictionary of education* (3rd. ed) New York: McGraw-Hill Book Company, 1973.

Good, J.E. & Good, M.G. Industrial arts involvement in career education. *Man/Society/Technology*, 1972, *31*, 205-208.

Gould, J. & Kolb, W.L. (Eds.) *A dictionary of the social sciences*. Toronto: Collier-Macmillan Canada Ltd., 1964.

Guilford, J.P. *Psychometric methods*. New York: McGraw-Hill Book Company, Inc., 1936.

Ible, D.A. *Problems in beginning industrial arts teaching*. Unpublished Master of Education thesis, University of Alberta, 1974.

Johnson, F. H. *A brief history of Canadian education*. Toronto: McGraw-Hill Company of Canada Ltd., 1970.

Swan, J. & Stapp, W.B. (Eds.) *Environmental education*. New York: Sage Publications, Inc., 1974.

Lewchuck L.L. *A concept of productive society interpreted by industrial arts teachers*. Unpublished Master of Education thesis, University of Alberta, 1969.

LeBlanc, D.R. Follow up study of industrial arts and vocational education graduates from the University of Alberta. Unpublished research paper, University of Alberta, 1972.

Maley, D. Relationship of industrial arts to occupational orientation. Man/Society/Technology, 1972, 31, 209-213.

Rieger, T.F., & Woods S. Teachers' evaluation of their preparation for teaching. (Research Monograph No.18). Edmonton, Alberta: The Alberta Teachers' Association, October 1971.

Rieger, T.F. Teachers' evaluation of their preparation for teaching. (Research Monograph No. 23). Edmonton, Alberta: The Alberta Teachers' Association, November, 1974.

Ross, R.T. Optimum orders for the presentation of pairs in the method of paired comparisons. Journal of Educational Psychology, 1934, 25, 375-382.

Shields L.J. A description of vocational teacher preparation at the University of Alberta. Unpublished Master of Education thesis, University of Alberta, Edmonton, 1970.

Simon, F. History of the provincial institute of technology and art. Unpublished Master of Education thesis, University of Alberta, Calgary, 1962.

Smith, J.C. The development of industrial arts multiple-activity in Alberta. Unpublished Master of Education thesis, University of Alberta, Edmonton, 1973.

Stapp, W.B. An instructional program approach to enrironmental education (K-12) - Based on an action model. In Swan, J. & Stapp, W.B. (Eds.) Environmental education. New York: Sage Publications, Inc., 1974.

Steeb, R.V. The role of industrial arts in career education. Man/Society/Technology, 1972 31, 260-265.

Thurstone, L.L. The method of paired comparisons for social values. Journal of Abnormal and Social Psychology, 1926-27, 21, 384-400.

Torgerson, W.S. *Theory and methods of scaling*. New York: John Wiley and Sons, Inc., 1958.

U.S Department of Health, Education and Welfare. *Standard terminology for curriculum and instruction in local and state school systems*. Washington: U.S. Government Printing Office, 1970.

Weiner, D.A. *Evaluation of the industrial arts teacher education curriculum at Peru State College*. Unpublished Doctor of Education dissertation, University of Northern Colarado, 1971. (University Microfilms No. 48106)

Winn, I.J. The environment of reform. *Phi Delta Kappan*, 1971, *53* (3), 157-159.

Wilson, J.D., Stamp, R.M. and Audet, L.(Ed) *Canadian Education: a history*. Scarbrough: Prentice Hall of Canada Ltd., 1970.

Ziel, H.R. Industrial arts and vocational education in a changing society. *The ATA Magazine*, September 1962, *43*, 16-18;43-44.

APPENDIX 1

Tables of Results

Table 6. Part 1

Scale Values for Goal Items by Category Group

Item No.	Category Group Identification*				
	A-1	A-2	A-3	B-1	B-2
1	+0.690	+0.936	+0.371	+0.563	+0.809
2	+1.157	+1.392	+0.806	+0.811	+1.522
3	+1.134	+0.832	+1.484	+1.141	+1.065
4	-0.356	-0.279	-0.423	-0.322	-0.344
5	-0.096	+0.231	-0.528	-0.168	-0.005
6	+0.437	+0.375	+0.487	+0.696	+0.112
7	-2.027	-1.881	-2.079	-1.986	-1.980
8	+1.004	+0.815	+1.198	+1.214	+0.756
9	+1.021	+0.919	+1.082	+1.083	+0.904
10	-0.914	-0.950	-0.857	-1.225	-0.616
11	-0.693	-0.780	-0.542	-0.558	-0.814
12	+0.086	+0.021	+0.156	+0.056	+0.138
13	-1.445	-1.632	-1.155	-1.305	-1.547

*See Table 1, page 59.

Table 6. Part 2

Scale Values for Goal Items by Category Group

Item No.	Category Group Identification*						
	C-1.	C-2.	C-3.	D-1.	D-2.	E-1.	E-2.
1	+0.290	+0.823	+0.797	+0.685	+0.635	+0.629	+0.667
2	+1.388	+1.016	+0.956	+1.300	+0.889	+1.116	+1.142
3	+1.599	+1.033	+0.955	+0.966	+1.580	+1.097	+1.172
4	-0.469	-0.187	-0.622	-0.588	-0.209	-0.207	-0.567
5	-0.394	+0.043	-0.212	+0.008	-0.381	+0.067	-0.327
6	+0.022	+0.245	+0.962	+0.365	+0.349	+0.638	+0.201
7	-1.833	-2.021	-1.922	-1.949	-2.000	-1.825	-2.175
8	+0.942	+0.974	+1.109	+1.058	+0.838	+1.102	+0.891
9	+0.963	+1.158	+0.836	+1.111	+1.008	+0.882	+1.221
10	-1.166	-0.991	-0.594	-1.053	-0.514	-1.144	-0.600
11	-0.491	-0.684	-0.877	-0.703	-0.613	-0.826	-0.538
12	+0.252	+0.102	+0.164	+0.089	+0.041	+0.017	+0.216
13	-1.103	-1.514	-1.553	-1.290	-1.625	-1.544	-1.303

*See Table 1, page 59.

Table 7. Part 1

Scale Values for Competency Items by Category Group

Item No.	Category Group Identification* A-1	A-2	A-3	B-1	B-2
1	+0.599	+0.612	+0.542	+0.684	+0.569
2	+1.803	+1.783	+1.735	+1.665	+1.748
3	+1.122	+1.248	+0.906	+1.572	+0.691
4	+0.564	+0.825	+0.137	+0.418	+0.656
5	-0.686	-0.733	-0.551	-0.583	-0.759
6	+0.311	+0.324	+0.250	+0.339	+0.349
7	+0.383	+0.343	+0.444	-0.004	+0.646
8	-1.812	-1.825	-1.695	-1.513	-2.123
9	-1.032	-0.723	-1.442	-1.214	-0.859
10	-0.116	-0.195	-0.011	-0.172	-0.002
11	+0.815	+0.404	+1.370	+0.856	+0.784
12	-0.681	-0.667	-0.693	-0.897	-0.465
13	-1.270	-1.396	-0.993	-1.152	-1.233

*See Table 1, page 59.

Table 7. Part 2

Scale Values for Competency Items by Category Group

Item No.	Category Group Identification* C-1.	C-2.	C-3.	D-1.	D-2.	E-1.	E-2.
1	+0.322	+0.708	+0.866	+0.049	+1.063	+0.301	+0.939
2	+1.749	+1.745	+1.512	+1.873	+1.463	+1.652	+1.834
3	+0.974	+1.360	+1.001	+1.263	+0.991	+1,227	+0.996
4	+1.269	-0.047	+0.418	+0.606	+0.867	+0.787	+0.308
5	-0.956	-0.277	-0.859	-0.645	-0.925	-0.411	-1.062
6	+0.477	-0.085	+0.453	+0.353	+0.144	+0.341	+0.285
7	+0.680	-0.264	+0.508	-0.034	+0.717	+0.399	+0.343
8	-1.582	-1.795	-1.827	-1.747	-1.687	-1.838	-1.805
9	-0.935	-1.167	-0.999	-0.999	-0.670	-1.065	-0.042
10	-0.143	+0.264	-0.392	+0.178	-0.429	+0.042	-0.281
11	+0.185	+0.994	+1.173	+0.984	+0.710	+0.715	+0.932
12	-0.733	+0.097	-0.926	-0.652	-0.897	-0.705	-0.606
13	-1.305	-1.341	-0.929	-1.229	-1.349	-1.445	-0.939

*See Table 1, page 59.

Table 8. Part 1

Scale Values for Content Area Items by Category Group

Item	Category Group Identification*				
No.	A-1	A-2	A-3	B-1	B-2
1	+1.691	+1.443	+2.040	+1.419	+1.825
2	+0.791	+1.006	+0.470	+0.786	+0.902
3	-1.332	-1.375	-1.201	-1.320	-1.490
4	+0.519	+0.670	+0.257	+0.627	+0.406
5	-0.945	-0.775	-1.041	-0.664	-1.015
6	+0.855	+0.640	+1.047	+1.085	+0.635
7	+0.505	+0.239	+0.811	+0.547	+0.469
8	+0.832	+0.929	+0.471	+0.728	+0.809
9	-0.955	-0.835	-1.104	-0.950	-1.059
10	-0.230	-0.503	+0.161	-0.397	-0.007
11	+0.796	+1.152	+0.290	+0.899	+0.737
12	-1.033	-1.248	-0.714	-1.146	-0.974
13	-1.494	-1.342	-1.487	-1.614	-1.241

*See Table 1, page 59.

Table 8. Part 2

Scale Values for Content Area Items by Category Group

Item	Category Group Identification*						
No.	C-1.	C-2.	C-3.	D-1.	D-2.	E-1.	E-2.
1	+1.692	+1.555	+1.529	+1.581	+1.582	+1.425	+1.822
2	+0.444	+1.000	+0.878	+0.966	+0.567	+0.655	+0.942
3	-1.463	-1.569	-1.053	-1.473	-0.996	-1.615	-1.089
4	+0.490	+0.486	+0.560	+0.958	+0.093	+0.593	+0.430
5	-1.109	-0.560	-0.783	-0.300	-1.473	-0.597	-1.086
6	+1.104	+1.173	+0.392	+0.951	+0.613	+0.998	+0.761
7	+0.476	+0.717	+0.354	+0.152	+0.861	+0.390	+0.646
8	+0.637	+0.562	+1.059	+0.543	+1.205	+0.858	+0.627
9	-0.787	-0.853	-1.114	-0.951	-0.965	-1.031	-0.868
10	-0.179	-0.167	-0.317	-0.292	-0.293	-0.546	+0.081
11	+0.835	+0.297	+1.204	+0.575	+1.031	+1.122	+0.500
12	-0.399	-1.190	-1.359	-1.060	-0.930	-0.824	-1.283
13	-1.729	-1.451	-1.348	-1.650	-1.250	-1.429	-1.483

*See Table 1, page 59.

Table 9.

Rank Order of Goals for Industrial Arts Teacher Education by Category Group.

Rank	Category Group Identification*											
	A-1	A-2	A-3	B-1	B-2	C-1	C-2	C-3	D-1	D-2	E-1	E-2
Order	Goal items											
1	2	2	3	8	2	3	9	8	2	3	2	9
2	3	1	8	3	3	2	8	6	8	9	8	3
3	9	9	9	9	9	9	3	2	9	2	3	2
4	8	3	2	2	1	8	2	3	3	8	9	8
5	1	8	6	6	8	1	1	9	1	1	6	9
6	6	6	1	1	12	12	6	1	6	6	1	12
7	12	5	12	12	6	6	12	12	12	12	5	6
8	5	12	4	5	5	5	5	5	5	4	12	5
9	4	4	11	4	4	4	4	10	4	5	4	11
10	11	10	5	11	10	11	11	4	11	10	11	4
11	10	11	10	10	11	13	10	11	10	11	10	10
12	13	13	13	13	13	10	13	13	13	13	13	13
13	7	7	7	7	7	7	7	7	7	7	7	7

* from Table 1, page 59

Table 10.

Rank Order of Industrial Arts Teacher Competencies by Category Group.

Rank Order	A-1	A-2	A-3	B-1	B-2	C-1	C-2	C-3	D-1	D-2	E-1	E-2
	Category Group Identification*											
	Goal items											
1	2	2	2	2	2	2	2	2	2	2	2	2
2	3	3	11	3	11	4	3	11	3	1	3	3
3	11	4	3	11	3	3	11	3	11	3	4	1
4	1	1	1	1	4	7	1	1	4	4	11	11
5	4	11	7	4	7	6	10	7	6	7	7	7
6	7	6	6	6	1	1	4	6	10	11	1	4
7	6	7	4	7	6	11	6	4	1	6	6	6
8	10	10	10	10	10	10	12	10	7	10	10	10
9	12	12	5	5	12	12	7	5	12	9	5	12
10	5	9	12	12	5	9	5	12	5	12	12	13
11	9	5	13	13	9	5	9	13	9	5	9	9
12	13	13	9	9	13	13	13	9	13	13	13	5
13	8	8	8	8	8	8	8	8	8	8	8	8

* from Table 1, page 59

Table 11.

Rank Order of industrial Arts Content Areas by Category Group.

Rank	Category Group Identification*											
	A-1	A-2	A-3	B-1	B-2	C-1	C-2	C-3	D-1	D-2	E-1	E-2
Order	Content Area items											
1	1	1	1	1	1	1	1	1	1	1	1	1
2	6	11	6	6	2	6	6	11	2	8	11	2
3	8	2	7	11	8	11	2	8	4	11	6	6
4	11	8	8	2	11	8	7	2	6	7	8	7
5	2	4	2	8	6	4	8	4	11	6	2	8
6	7	6	11	4	7	7	4	6	8	2	4	11
7	4	7	4	7	4	2	11	7	7	4	7	4
8	10	10	10	10	10	10	10	10	10	10	10	10
9	5	5	12	5	12	12	5	5	5	12	5	9
10	9	9	5	9	5	9	9	3	9	9	12	5
11	12	12	9	12	9	5	12	9	12	3	9	3
12	3	13	3	3	13	3	13	13	3	13	13	12
13	13	3	13	13	3	13	3	3	13	5	3	13

* from Table 1, page 59

Table 12.

Correlation Coefficients between Categories

Category Group	Questionnaire Section *A	Questionnaire Section *B	Questionnaire Section *C
Geographic Location			
North / South	0.913	0.911	0.878
Population Density			
Urban / Non-Urban	0.935	0.922	0.963
Teaching Experience			
1-4 yrs. / 5-10 yrs.	0.946	0.807	0.934
5-10 yrs. / More than 10 yrs.	0.957	0.885	0.912
1-4 yrs. / More than 10 yrs.	0.902	0.908	0.903
School Assignment			
Junior High / Senior High	0.949	0.898	0.848
Teacher Education			
Univ. of Alberta / Other	0.952	0.899	0.924

*A Goals of industrial arts teacher education.
*B Industrial arts teacher competencies.
*C Industrial arts content areas.

APPENDIX 2

Survey Instrument

Department of Industrial
and Vocational Education,
University of Alberta,

29th April, 1975.

Dear Colleague,

As a teacher of industrial arts you are, no doubt, vitally interested in new developments in industrial arts teacher education in Alberta.

The recently announced appointment of Dr. K. Puffer to the position of Chairman of the above department may result in further changes by way of a new emphasis and direction in the industrial arts teacher education program.

It is my belief that teachers who are responsible for the implementation of the industrial arts curriculum in the schools of the Province, should be consulted before any such changes are made.

Department of Education statistics over the past ten years indicate a drop in the percentage of high school students enrolled in industrial arts from 18 percent to the present eight percent. In the same period, industrial arts enrollment in the junior high schools has increased from 27 percent to just over 30 percent of the school population.

If the industrial arts teacher education program is to prepare teachers to meet the challenges of change and development in Alberta:

What are the important goals of industrial arts teacher education?

What specific competencies should be developed by prospective industrial arts teachers to prepare them for entry into the teaching profession?

In order that your opinion may be included in this survey, I would be grateful if you would give about 30 minutes of your time to answer the enclosed questionnaire, and return it in the envelope provided by return mail.

As you read through this questionnaire to see what it is all about, why not save yourself some time and energy by answering the items at your first reading?

Thank you for your co-operation,

Department of Industrial
and Vocational Education,
University of Alberta,

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Dear Colleague,

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Department of Education statistics over the past ten years indicate a drop in the percentage of high school students enrolled in industrial arts from 18 percent to the present eight percent. In the same period, industrial arts enrollment in the junior high schools has increased from 27 percent to just over 30 percent of the school population.

If the industrial arts teacher education program is to prepare teachers to meet the challenges of change and development in Alberta:

What specific competencies should be developed by prospective industrial arts teachers to prepare them for entry into the teaching profession?

What are the important industrial arts content areas which should be required of a student enrolled in the industrial arts teacher education program?

In order that your opinion may be included in this survey, I would be grateful if you would give about 30 minutes of your time to answer the enclosed questionnaire, and return it in the envelope provided by return mail.

As you read through this questionnaire to see what it is all about, why not save yourself some time and energy by answering the items at your first reading?

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What are the important goals of industrial arts teacher education?

What are the important industrial arts content areas which should be required of a student enrolled in the industrial arts teacher education program?

In order that your opinion may be included in this survey, I would be grateful if you give about 30 minutes of your time to answer the enclosed questionnaire, and return it in the envelope provided by return mail.

As you read through this questionnaire to see what it is all about, why not save yourself some time and energy by answering the items at your first reading?

Thank you for your co-operation,

INDUSTRIAL ARTS TEACHER OPINION SURVEY

Instructions PLEASE READ CAREFULY

1. Complete the details as required in Part 1.

Where appropriate place a check in the [ ] provided.

2. For each section of Part 2 read the uncompleted statement heading the paired items.

Examine the following pairs of items, and indicate which item of each pair that you consider to be more important for industrial arts teacher education by placing the number of that item in the appropriate box eg. [2].

NOTE

Respond to every pair.
Indicate your choice by either 1 or 2.
Do NOT spend excessive time over any one pair.
There are no right or wrong answers.

Please let your thoughts and opinions of the needs of industrial arts teachers and their preparation be your guide in completing this quetionnaire.

Thank you for your co-operation, it is greatly appreciated.

INDUSTRIAL ARTS TEACHER OPINION SURVEY

PART 1

Subject Information Sheet

Name ....

Degrees Held ....

School ....

School Enrollment

less than 500 ....[ ]

500 to 1000 ....[ ]

1001 to 1500 ....[ ]

more than 1500 ....[ ]

Number of Years Teaching Experience ....[ ]

Initial Teacher Education Institution

University of Alberta at Calgary ....[ ]

University of Alberta at Edmonton ....[ ]

Other ....[ ]

If other please specify ....

INDUSTRIAL ARTS TEACHER OPINION SURVEY

PART 2. GOALS OF INDUSTRIAL ARTS TEACHER EDUCATION

As a teacher of industrial arts I believe that the most important goal for the industrial arts teacher education program is to develop or provide the student teacher with:

1. The opportunity to attain emotional and social adjustment.

---[ ]

2. A knowledge of lesson plans and programming for the multiple activity laboratory.

1. The characteristics of flexibility and adaptability to cope with future change.

---[ ]

2. An understanding of child growth and development and its relationship to learning theory.

1. An understanding of the community and its human and material resource potential.

---[ ]

2. An understanding and acceptance of professional ethics.

1. The appropriate and sufficient industrial arts subject matter background.

---[ ]

2. The ability to develop and manage appropriate learning situations for industrial arts.

1. The opportunity to attain emotional and social adjustment.

---[ ]

2. A sincere desire to interest, guide and work with children.

1. The characteristics of flexibility and adaptability to cope with future change.

---[ ]

2. A defensible and practical philosophy of industrial arts education.

1. An understanding of the community and its human and material resource potential.

---[ ]

2. A knowledge of lesson plans and programming for the multiple activity laboratory.

1. A desire for further study and professional growth.

---[ ]

2. An understanding of child growth and development and its relationship to learning theory.

1. The ability to convey ideas, feelings and/or experiences to others with clarity.

---[ ]

2. An understanding and acceptance of professional ethics.

1. The ability to foster in children the potential for enquiry, experiment and analysis.

---[ ]

2. The appropriate and sufficient industrial arts subject matter background.

1. A sincere desire to interest, guide and work with children.

--[ ]

2. The ability to develop and manage appropriate learning situations for industrial arts.

1. A defensible and practical philosophy of industrial arts education.

--[ ]

2. The opportunity to attain emotional and social adjustment.

1. A knowledge of lesson plans and programming for the multiple activity laboratory.

--[ ]

2. The characteristics of flexibility and adaptability to cope with future change.

1. An understanding of child growth and development and its relationship to learning theory.

--[ ]

2. An understanding of the community and its human and material resource potential.

1. An understanding and acceptance of professional ethics.

--[ ]

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--[ ]

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---[ ]

2. The ability to develop and manage appropriate learning situations for industrial arts.

1. A desire for further study and professional growth.

---[ ]

2. The opportunity to attain emotional and social adjustment.

1. An understanding of the community and its human and material resource potential.

---[ ]

2. The characteristics of flexibility and adaptability to cope with future change.

1. The appropriate and sufficient industrial arts subject matter background.

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2. An understanding of child growth and development and its relationship to learning theory.

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---[ ]

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--[ ]

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1. An understanding of child growth and development and its relationship to learning theory.

--[ ]

2. The ability to foster in children the potential for enquiry, experiment and analysis.

1. A knowledge of lesson plans and programming for the multiple activity laboratory.

---[ ]

2. The ability to convey ideas, feelings and/or experiences to others with clarity.

1. A defensible and practical philosophy of industrial arts education.

---[ ]

2. A desire for further study and professional growth.

1. A sincere desire to interest, guide and work with children.

---[ ]

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1. The ability to develop and manage appropriate learning situations for industrial arts.

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--[ ]

2. The characteristics of flexibility and adaptability to cope with future change.

1. The ability to develop and manage appropriate learning situations for industrial arts.

--[ ]

2. The opportunity to attain emotional and social adjustment.

If after completing this questionaire, you feel that there are other goals which you consider to be of importance for industrial arts teacher education, please list them in the space provided below:

INDUSTRIAL ARTS TEACHER OPINION SURVEY

PART 2. INDUSTRIAL ARTS COMPETENCIES

As a teacher of industrial arts, I believe that the *most important* competency which should be developed by industrial arts teachers in their teacher education program is:

1. Skill in the proper and safe use of hand tools.

---[ ]

2. Skill in the proper and safe use of machines and equipment.

1. An understanding and appreciation of good industrial design.

---[ ]

2. The skill and knowledge necessary to teach the fundamental concepts of industrial technology.

1. An understanding of industry and its effect on the environment and society.

---[ ]

2. The ability to budget, requisition and manage the control of materials, tools and equipment.

1. An appreciation of industrial arts and its role in the general education of children.

---[ ]

2. The ability to understand and interpret industry and the productive society.

1. A knowledge and appreciation of the materials used in industry.

---[ ]

2. The ability to solve problems by the use of the materials and processes of industry.

1. A knowledge and understanding of vocational and/or career guidance.

--[ ]

2. The ability to maintain the tools and equipment used in the multiple activity laboratory.

1. The ability to create and interpret engineering and architectural drawings.

--[ ]

2. Skill in the proper and safe use of hand tools.

1. The skill and knowledge necessary to teach the fundamental concepts of industrial technology.

--[ ]

2. Skill in the proper and safe use of machines and equipment.

1. The ability to budget, requisition and manage the control of materials, tools and equipment.

--[ ]

2. An understanding and appreciation of good industrial design.

1. The ability to understand and interpret industry and the productive society.

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2. An understanding of industry and its effect on the environment and society.

1. The ability to solve problems by the use of the materials and processes of industry.

--[ ]

2. An appreciation of industrial arts and its role in the general education of children.

1. The ability to maintain the tools and equipment used in the multiple activity laboratory.

--[ ]

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2. A knowledge and understanding of vocational and/or career guidance.

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2. The ability to budget, requisition and manage the control of materials, tools and equipment.

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2. The ability to understand and interpret industry and the productive society.

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2. The ability to solve problems by the use of the materials and processes of industry.

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--[ ]

2. An understanding and appreciation of good industrial design.

If after completing this questionaire, you feel that there are other competencies which you consider to be of importance for industrial arts teacher education, please list them in the space provided below:

INDUSTRIAL ARTS TEACHER OPINION SURVEY

PART 2. INDUSTRIAL ARTS CONTENT AREAS

As a teacher of industrial arts, I believe that the most important industrial arts content area which should be given major emphasis in the industrial arts teacher education program is:

1. Woodwork
---------------------[ ]
2. Metalwork

1. Industrial Ecology
---------------------[ ]
2. Arts and Crafts

1. Industrial Design
---------------------[ ]
2. Plastics

1. Electronics
---------------------[ ]
2. Ceramics

1. Materials Science
---------------------[ ]
2. Graphics

1. Production Science
---------------------[ ]
2. Drafting

1. Power Technology
---------------------[ ]
2. Woodwork

1. Arts and Crafts
---------------------[ ]
2. Metalwork

1. Plastics
---------------------[ ]
2. Industrial Ecology

1. Ceramics
---------------------[ ]
2. Industrial Design

1. Graphics
---------------------[ ]
2. Electronics

1. Drafting
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2. Materials Science

1. Power Technology
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----------------------[ ]
2. Industrial Ecology

If after completing this questionnaire, you feel that there are other areas which you consider to be of importance for industrial arts teacher education, please list them in the space provided below:

APPENDIX 3

Permission Request

Follow-up Letter

Letter of Appreciation

FACULTY OF EDUCATION
DEPARTMENT OF INDUSTRIAL AND
VOCATIONAL EDUCATION
TELEPHONE (403) 432-3878

THE UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA, CANADA
T6G 0Y1

Superintendent of Schools

Dear Sir:

For the research project required by the University of Alberta as a requirement for the Master of Education degree, I have proposed to survey the opinions of industrial arts teachers in the Province of Alberta in regard to industrial arts teacher education.

With your permission, it is intended to seek the assistance of a number of industrial arts teachers employed in your district in an attempt to ascertain industrial arts teachers perception of the relative importance of the goals of industrial arts teacher education, the competencies which should be developed by the student teacher and the areas or courses which should be provided in the industrial arts teacher education program.

The survey instrument has been divided into two parts with each recipient being requested to complete the information sheet and two of the three sections of Part 2, which consists of 13 item matched-pairs questionnaires.

For your information a copy of the items used in Part 2 have been enclosed.

Experience has shown that it may take up to 30 minutes for each participant to complete all requirements of the instrument.

I would be grateful for your assistance in permitting me to contact the industrial arts teachers in the schools attached.

Yours sincerely,

P. G. Haywood,
Graduate Student,
Department of Industrial
and Vocational Education

PGH/ck

FACULTY OF EDUCATION
DEPARTMENT OF INDUSTRIAL AND
VOCATIONAL EDUCATION
TELEPHONE (403) 432-3678

THE UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA, CANADA
T6G 0Y1

Dear Colleague:

Just over one week ago you should have received through the mail a copy of a questionnaire relating to the important aspects of industrial arts teacher education. As many of these questionnaires have been completed and returned, I would appreciate your early response so that I may carry out the necessary statistical analysis. While I realize that the task may appear to be rather enormous, particularly at this time of the year, I do believe that you as a teacher of industrial arts can make a significant contribution to this study.

There are 13 items in each section of the questionnaire, no pairs are repeated. You are required to make a choice between each item but do not spend too much time over each pair - let your initial thoughts be your guide in completing this questionnaire.

If you have already responded to the questionnaire and mailed it, please disregard this letter.

Thank you for your cooperation.

Sincerely,

P. G. Haywood,
Graduate Student,
Department of Industrial
and Vocational Education.

PGH/ck

FACULTY OF EDUCATION
DEPARTMENT OF INDUSTRIAL AND
VOCATIONAL EDUCATION
TELEPHONE (403) 432-3678

THE UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA, CANADA
T6G 0Y1

Thank you for your prompt response to my questionnaire relating to some of the important aspects of industrial arts teacher education.

Your interest and contribution, which in fact represents that of five of your fellow teachers, will, I feel sure, play a significant role in my study.

In expressing my sincere gratitude for your participation I would like to wish you all the best in the profession for the future.

Thank you for your cooperation.

Sincerely,

P. G. Haywood,

Department of Industrial
and Vocational Education.

PGH/ck